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Georgia State Primer

A Primer on Developing Georgia's Landfill Gas-to-Energy Potential

LANDFILL METHANE OUTREACH PROGRAM

CEFA

The Georgia Environmental Facilities Authority

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Introduction

1 About the Landfill Methane Outreach Program

The EPA Landfill Methane Outreach Program

The recovery of energy from landfill gas provides local and global environmental and energy benefits, as well as economic benefits. The methane captured from landfills can be transformed into a cost-effective fuel source for generating electricity and heat, firing boilers, or even powering vehicles.

To promote the use of landfill gas as an energy resource, the U.S. Environmental Protection Agency (EPA) has established the Landfill Methane Outreach Program (LMOP). The goals of LMOP are to reduce methane emissions from landfills by:

- Encouraging environmentally and economically beneficial LFGTE development
- Removing barriers to developing LFGTE projects

To achieve these goals, EPA establishes alliances with four key constituencies:

- State environmental and energy agencies
- Energy users/providers (including investor-owner, municipal and other public power utilities, cooperatives, direct end users, and power marketers)
- Industry (including developers, engineers, and equipment vendors)
- Community partners (municipal and small private landfill owners and operators; cities, counties, and other local governments; and community groups)

EPA establishes these alliances through a Memorandum of Understanding (MOU). By signing the MOU, each ally acknowledges a shared commitment to promoting landfill gas energy recovery at solid waste landfills, recognizes that the widespread use of landfill gas as an energy resource will reduce methane and other air emissions, and commits to certain activities that enhance the development of this resource.

As of January 1999, over 240 landfill methane recovery projects were operating in the United States. EPA estimates that up to 750 landfills could install economically viable landfill energy projects by the year 2000.

LFGTE Projects in Georgia

Georgia is a member of the LMOP State Ally Program, which encourages cooperation between EPA and state energy and environmental agencies to promote the development of LFGTE resources. Georgia's Landfill Gas Recovery Program focuses on developing consensus among landfill operators, utility companies, independent power producers, project developers, utility regulators, and the state's regulators so they can work together to promote new energy and environmental opportunities from which all Georgia residents will benefit.

Three LFGTE projects were operating in Georgia as of July 1998, and three were planned. According to EPA and the state of Georgia, 16 landfills have the potential to support economically viable LFGTE projects. The following table lists Georgia's 16 candidate landfills.

Table A Candidate Landfills for LFGTE Projects in Georgia

Landfill Name	County	Operational Status
Arnold Road LF	Gwinnett	Open
Atlanta—Gun Club Rd.	Fulton	Open
Atlanta—Key Rd.	Fulton	Ceased receiving waste/In closure
Baker Place Rd.	Columbia	Open
BF1—Roberts Rd.	Fayette	Closed
Columbus—Schatulga Rd.	Muscogee	Open
Dean Bridge Rd.	Richmond	Open
Fleming/Gaissert Rd.	Dougherty	Open
Forsyth, Old Brent Rd.	Monroe	Ceased receiving waste/In closure
Seminole Rd.	Dekalb	Open
Southern States—Bolton Rd.	Fulton	Closed
Southern States—SR 90/SR 127	Taylor	Open
Speedway—SR 324	Barrow	Ceased receiving waste/In closure
UWL Inc.—Richland Creek	Gwinnett	Open
WMI—Live Oak	Dekalb	Open
WMI—Rolling Hills	Clayton	Closed

Source: EPA's Opportunities for Landfill Gas Energy Recovery in Georgia: Draft Profiles of Candidate Landfills and Current Projects and information provided by the state of Georgia.

2 Electricity Restructuring and LFGTE

What Is Electricity Restructuring?

Electricity restructuring refers to the introduction of competition into both the wholesale and retail electricity markets. Until now, electric utilities operated under monopolies authorized by federal and state regulatory authorities as the sole provider of electric service to consumers within a specific service territory. Under restructuring, utilities will lose these monopolies, enabling other energy providers to compete for their customers. The result will be more energy options for consumers, lower energy prices, and greater use of renewable energy sources.

Efforts to restructure the electric utility industry began in 1978 with passage of the Public Utilities Regulatory Policies Act (PURPA), which required utilities to buy a portion of their power from unregulated power generators in an effort to encourage the development of smaller generating facilities, new technologies, and renewable energy sources. The National Energy Policy Act of 1992 (EPACT) expanded on PURPA, allowing more types of unregulated companies to generate and sell electricity, effectively creating a competitive wholesale market for electric power.

Restructuring at the retail level has been a hot issue in many states since the passage of EPACT, which delegated to states the authority to introduce competition among electric utilities within their borders. As of January 1999, fourteen states have since enacted some form of restructuring legislation, while the remaining 36 are considering such legislation.

How Do These Changes Affect Landfill Gas Recovery?

Many states are including renewable energy provisions in their restructuring legislation. Such provisions mandate utilities to include a certain percentage of electricity generated from renewable, or "green energy," sources into their energy mixes. LFGTE is one such green energy source.

In March 1998, the Clinton Administration unveiled its "Comprehensive Electricity Competition Plan" to restructure the electricity industry nationwide. Contained in this proposal is a Renewable Portfolio Standard (RPS) that would guarantee that a minimum percentage of the nation's electricity be powered by green energy. Energy service providers would be required to cover a percentage of their electricity sales with generation from non-hydroelectric renewable sources such as wind, solar, geothermal, and biomass (which includes LFGTE).

Marketing Landfill Gas Recovery as Green Power

One of the emerging areas and most promising mechanisms to encourage utilities and other energy marketers to participate in LFGTE projects is the development of green marketing programs. Green marketing programs are designed to enable energy marketers to position renewable energy products (including LFGTE) as premium products, and therefore, collect a premium price from their customers. In addition, green marketing allows energy marketers in competitive marketplaces to differentiate their energy product, and allows utilities in non-restructured marketplaces to gain critical product marketing experience in preparation for competition. However, the general public is less familiar with LFGTE than other sources of renewable energy; support from the LMOP is often critical to ensure the success of early LFGTE green marketing efforts.

Get the Latest Information on Electricity Restructuring in Your State

For up-to-date information on electricity restructuring in Georgia and elsewhere, visit the National Conference of State Legislatures Web site at: http://www.ncsl.org/programs/esnr/restru.htm. This site contains a glossary of terms related to restructuring, as well as links to the full text of restructuring legislation passed by states.

3 The Goals of This Primer

Permits, incentive programs, and policies for LFGTE project development vary greatly from state to state. To guide LFGTE project developers through the state permitting process and to help them to take advantage of state incentive programs, the LMOP has worked with state agencies to develop individual primers for states participating in the State Ally Program. By presenting the latest information on federal and state regulations and incentives affecting LFGTE projects in this primer, the LMOP and Georgia state officials hope to facilitate development of many of the landfills listed in Table A.

To develop this primer, the state of Georgia identified all the permits and funding programs that could apply to LFGTE projects developed in Georgia. It should be noted, however, that the regulations, agencies, and policies described are subject to change. Changes are likely to occur whenever a state legislature meets, or when the federal government imposes new directions on state and local governments. LFGTE project developers should verify and monitor the status of laws and rules that might affect their plans or the operations of their projects.

Who Should Read This Primer?

Throughout the country, the number of landfill gas-to-energy (LFGTE) projects is growing. Recovering methane gas at solid waste landfills provides significant environmental and economic benefits by eliminating methane emissions while capturing the emissions' energy value.

This primer is designed to help realize the potential of landfill gas recovery in the state of Georgia. It provides information for developers of LFGTE projects, as well as all other participants in such projects: landfill operators, utility companies, independent power producers, utility regulators, state regulators, engineers, and equipment vendors.

What Information Does This Primer Contain?

If you are interested in taking advantage of the economic and environmental opportunities in LFGTE recovery in Georgia, you will need to know the regulatory requirements that apply. You will also need to know what economic incentives are available to help make these projects more economically viable.

To address these needs, this primer covers the following topics:

- Federal Standards and Permits. This section provides information on federal regulations that may pertain to LFGTE projects, including solid waste, air quality, and water quality regulations.
- State Standards and Permits. This section provides information on state permits that apply to landfill gas recovery projects in the state of Georgia.
- Local Standards and Permits. Local permit approval will often be needed for LFGTE projects. This section offers a step-by-step process you can follow to secure this approval.
- Federal Incentive Programs. This section presents information on federal incentives that may apply to LFGTE projects.
- State Funding Programs. This section presents information on the environmental infrastructure financing opportunities that are available in the state of Georgia.

4 Where Can I Go for More Information?

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Part 1: Standards and Permits

1 Overview of Federal Standards and Permits

The following section discusses federal regulations that may pertain to LFGTE projects. The LFGTE projects can be subject to solid waste, air quality, and water quality regulations. The federal regulations are presented in general terms, because individual state/local governments generally develop their own regulations for carrying out federal mandates. Specific requirements may therefore differ among states. Project developers will have to contact relevant federal agencies and, in some cases, state agencies for more detailed information and applications. The discussion of each key federal standard/permit contains three components:

- Importance of the standard/permit to LFGTE project developers
- Applicability to LFGTE projects
- Description of each standard/permit

1.1 Resource Conservation and Recovery Act Subtitle D

Importance Before a LFGTE project can be developed, all Resource Conservation and Recovery Act (RCRA) Subtitle D requirements (i.e., requirements for non-hazardous waste management) must be satisfied.

Applicability Methane is explosive in certain concentrations and poses a hazard if it migrates beyond the landfill facility boundary. Landfill gas collection systems must meet RCRA Subtitle D standards for gas control.

Description Since October 1979, federal regulations promulgated under Subtitle D of RCRA required controls on migration of landfill gas. In 1991, EPA updated landfill design and performance standards. The newer standards apply to municipal solid waste landfills that were active on or after October 9, 1993. Specifically, the standards require monitoring of landfill gas and establishing performance standards for combustible gas migration control. Monitoring requirements must be met at landfills not only during their operation, but also for a period of 30 years after closure.

Landfills affected by RCRA Subtitle D are required to control gas by establishing a program to periodically check for methane emissions and prevent offsite migration. Landfill owners and operators must ensure that the concentration of methane gas does not exceed:

- 25 percent of the lower explosive limit for methane in facilities' structures
- The lower explosive limit for methane at the facility boundary

Permitted limits on methane levels reflect the fact that methane is explosive within the range of 5 to 15 percent concentration in air. If methane emissions exceed permitted limits, corrective action (i.e., installation of a landfill gas collection system) must be taken. Subtitle D may provide an impetus for some landfills to install energy recovery projects in cases where a gas collection system is required for compliance (see 40 CFR Part 258 for more information).

1.2 Clean Air Act (CAA)

The CAA regulates emissions of pollutants to ensure that air quality meets specified health and welfare standards. The CAA contains two provisions that may affect LFGTE projects: New Source Performance Standards (NSPS) and New Source Review (NSR). Facilities that are planning to construct a new LFGTE system or that plan to modify a landfill operation to incorporate a LFGTE system must obtain a Permit to Construct and Operate from the responsible air regulatory agency if emissions from the project are expected to exceed the major facility emission thresholds. The Permit to Construct and Operate specifies the NSPS and NSR requirements that the project must meet. Once construction is complete, the facility must obtain an operating permit that meets the requirements defined in Title V of the 1990 CAA Amendments. The general requirements of NSPS, NSR, and Title V for LFGTE projects are discussed below.

Non-Methane Organic Compounds Emissions (NMOCs): New Source Performance Standards (NSPS)

Importance LFGTE projects can be part of a compliance strategy to meet EPA's new emissions standards for landfill gas.

Applicability Landfills meeting certain design capacity, age, and emissions criteria are required to collect landfill gas and either flare it or use it for energy.

Description EPA final regulations under Title I of the CAA Amendments require affected landfills to collect and control landfill gas. Specifically, the CAA targets reductions in the emissions of NMOCs found in landfill gas because they contribute to local smog formation. For landfills last modified on or before May 30, 1991, and that received waste after November 8, 1987 ("existing landfills"), the standards are "Emissions Guidelines" (EG), which has been incorporated as Georgia Rule (ggg)—"Municipal Solid Waste Landfills."

For landfills that began construction or accepted waste for the first time on or after May 30, 1991 ("new landfills"), the standards are "New Source Performance Standards" (NSPS). The final regulations can be found in the Federal Register, March 12, 1996, Vol. 61, No. 49, pgs. 9907-9944, or can be obtained from the National Technical Information Service (NTIS) at (703) 487-4650. Ask for PB96-153465.

The basic requirements to determine if controls for landfill gas are necessary are the same for both existing and new landfills. Landfills that exceed both of the following criteria must comply with collection system requirements.

- Capacity—Maximum design capacity greater than or equal to 2.5 million Mg[1] (or 2.75 million tons) or 3.27 million yd^3
- Emissions—Annual NMOC emission rate is greater than 50 metric tons.

Air Emissions: New Source Review (NSR) Permitting Process

Importance New LFGTE projects may be required to obtain pre-construction permits under New Source Review (NSR). Depending on the area in which the project is located, obtaining these permits may be the most critical aspect of project approval.

Applicability The combustion of landfill gas results in emissions of carbon monoxide and oxides of nitrogen. Requirements vary for control of these emissions depending on local air quality. The relevant standards for a particular area will be discussed in Section 2,

[1]Landfills with less than 2.5 million Mg are required to file a design capacity report.

State Standards and Permits. Applicability of these standards to LFGTE projects will depend on the level of emissions resulting from the technology used in the project and the project's location (i.e., attainment or non-attainment area).

Description CAA regulations require new stationary sources and modifications to existing sources of certain air emissions to undergo NSR before they can operate. The purpose of these regulations is to ensure that sources meet the applicable air quality standards for the area in which they are located. Because these regulations are complex, a landfill owner or operator may want to consult an attorney or expert familiar with NSR for more information about permit requirements in a particular area. Air permitting requirements should also be discussed with the Air Protection Branch of Georgia's Environmental Protection Division.

The existing CAA regulations for attainment and maintenance of ambient air quality standards regulate six criteria pollutants—ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (PM-2.5 and PM-10), sulfur dioxide (SO_2), and lead. The CAA authorizes the EPA to set both health- and public welfare-based national ambient air quality standards (NAAQS) for each criteria pollutant. Areas that meet the NAAQS for a particular air pollutant are classified as being in "attainment" for that pollutant and those that do not are in "non-attainment." Because each state is required to develop an air quality implementation plan (called a State Implementation Plan or SIP) to attain and maintain compliance with the NAAQS in each Air Quality Control Region within the state, specific permit requirements will vary by state. Currently, Atlanta is the only "non-attainment" area in Georgia for ozone. (See 40 CFR 51.160-51.166 for more information.)

The location of the LFGTE project will dictate which kinds of construction and operating permits are required. If the landfill is located in an area that is in attainment for a particular pollutant, the LFGTE project must undergo Prevention of Significant Deterioration permitting if emission levels exceed major source thresholds. Nonattainment area permitting is required for those landfills that are located in areas that do not meet the NAAQS for a particular air pollutant. Furthermore, the level of emissions from the project determines whether the project must undergo major NSR or minor NSR. The requirements of major NSR permitting are greater than those for minor NSR. The following section provides more detail on new source permits.

Prevention of Significant Deterioration Permitting

Prevention of Significant Deterioration (PSD) review is used in attainment areas to determine whether a new or modified emissions source will cause significant deterioration of local air quality. Georgia's Air Protection Branch can assist landfill gas project developers in determining whether a proposed LFGTE project requires PSD approval.

All areas are governed to some extent by PSD regulations because no location is in attainment for all criteria pollutants. Applicants must determine PSD applicability for each individual pollutant. For gas-fired sources, PSD major NSR is required if the new source will emit or has the potential to emit any criteria pollutant at a level greater than 250 tons per year.

For each pollutant for which the source is considered major, the PSD major NSR permitting process requires that the applicants determine the maximum degree of reduction achievable through the application of available control technologies. Specifically, major sources may have to undergo any or all of the following four PSD steps:

- Best Available Control Technology (BACT) analysis
- Monitoring of local air quality

- Source impact analysis/modeling
- Additional impact analysis/modeling (i.e., impact on vegetation, visibility, and Class I areas)[2]

Minor sources and minor modifications (i.e., below 250 tons per year) are exempt from this process, but these sources may still be required to obtain construction and operating air permits (see CFR. 40 CFR 52.21 for more information on PSD).

Nonattainment Air Permitting

An area that does not meet the NAAQS for one or more of the six criteria pollutants is classified as being in "nonattainment" for that pollutant. Ozone is the most pervasive nonattainment pollutant, and the one most likely to affect LFGTE projects. (The Atlanta metro-area is a nonattainment area for ozone.) A proposed new emissions source or modification of an existing source located in a nonattainment area must undergo nonattainment major NSR if the new source or the modification is classified as major (i.e., if the new or modified source exceeds specified emissions thresholds). To obtain a nonattainment NSR permit for criteria pollutants, the project:

- Must use technology that achieves the Lowest Achievable Emissions Rate (LAER) for the nonattainment pollutant
- Must arrange for an emissions reduction at an existing source that offsets the emissions from the new project at specific ratios

Potential Exemptions

EPA recently furnished a guidance document to state and regional permitting authorities that provides an exemption from major NSR permitting requirements for landfill projects that qualify as "pollution control projects." An existing landfill that plans to install a LFGTE recovery project may qualify as a pollution control project as long as it reduces non-methane organic compounds (NMOC) at the site. Under the guidance, the permitting authority may exempt the project from major NSR, provided it meets all other requirements under the CAA and the state, including minor source requirements. In nonattainment areas, offsets will still be required, but need not exceed a 1:1 ratio. States have discretion to exercise the increased flexibility allowed by the guidance on a case-by-case basis.

Title V Operating Permit

Importance Many LFGTE projects must obtain operating permits that satisfy Title V of the 1990 CAA Amendments.

Applicability Any LFGTE plant that is a major source, as defined by the Title V regulation (40 CFR Part 70), must obtain an operating permit.

Description Title V of the CAA requires that all major sources obtain new federally enforceable operating permits. Title V is modeled after a similar program established under the National Pollution Discharge Elimination System (NPDES). The purpose of Title V is to clarify, in a single document, all the air requirements applicable to a facility. Each major source subject to Title V must submit an application for an operating permit to Georgia's Air Protection Branch describing and quantifying all air pollution sources. The operating permit describes the emission limits and operating conditions that a facility must satisfy, and specifies the reporting requirements that a facility must meet to show compliance with the air pollution regulations. A Title V operating permit must be renewed every 5 years.

[2]Class I areas are specified under the Clean Air Act and include national parks. Projects situated within a certain distance from Class I areas are subject to more stringent criteria for emissions levels.

1.3 National Pollutant Discharge Elimination System (NPDES) Permit

Importance LFGTE projects may need to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharging wastewater that is generated during the energy recovery process.

Applicability Landfill gas condensate forms when water and other vapors condense out of the gas stream due to temperature and pressure changes within the collection system. This wastewater must be removed from the collection system. In addition, LFGTE projects may generate wastewater from system maintenance and cooling tower blowdown.

Description NPDES permits regulate discharges of pollutants to surface waters. The authority to issue these permits is delegated to state governments by EPA. The permits, which typically last 5 years, limit the quantity and concentration of pollutants that may be discharged. To ensure compliance with the limits, permits require wastewater treatment or impose other operation conditions. The state water offices or EPA regional office can provide further information on these permits.

The permits are required for three categories of sources and can be issued as individual or general permits. A LFGTE project would be included in the "wastewater discharges to surface water from industrial facilities" category and would require an individual permit. An individual permit application for wastewater discharges typically requires information on water supply volumes; water utilization; wastewater flow; characteristics and disposal methods; planned improvements; storm water treatment; plant operation; materials and chemicals used; production; and other relevant information.

1.4 Clean Water Act, Section 401

Importance LFGTE projects may need Clean Water Act (CWA) Section 401 certification for constructing pipelines that cross streams or wetlands.

Applicability Landfill gas recovery collection pipes or distribution pipes from the landfill to a nearby gas user may cross streams or wetlands. When construction or operation of such pipes causes any discharge of dredge into streams or wetlands, the project may require Section 401 certification.

Description If the construction or operation of facilities results in any discharge into streams or wetlands, such construction is regulated under Section 401. This requirement may affect the construction of LFGTE project facilities or pipelines to transport landfill gas.

The applicant must obtain a water quality certification from the State in which the discharge will originate. The certification should then be sent to the U.S. Army Corps of Engineers. The certification indicates that such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the CWA.

1.5 Other Federal Permit Programs

The following are brief descriptions of how other federal permits could apply to LFGTE project development:

- RCRA Subtitle C could apply to a landfill gas project if it produces hazardous waste. While some landfill gas projects can return condensate to the landfill, many dispose of it through the public sewage system after some form of on-site treatment. In some cases, the condensate may contain high enough concentrations of heavy metals and organic chemicals for it to be classified as a hazardous waste, thus triggering federal regulation.
- The Historic Preservation Act of 1966 or the Endangered Species Act could apply if power lines or gas pipelines associated with a project infringe upon an historic site or an area that provides habitat for endangered species.

2 State Standards and Permits

This section provides summarized information on permits required by the state of Georgia for the development of a LFGTE project.[3] Information provided on each permit includes: how the permit is applicable to LFGTE projects; the appropriate agency contact; a description of the permit; the statute/regulation; information required and suggestions for a successful application; the application and review process; the review/approval period; and any fees required. For an overview of required permits, contact information, and length of the review period, see Tables 2.1 and 2.2.

Air-Related Issues: For Title V purposes, landfills that are contiguous or adjacent can be considered one site. Or, a landfill that is owned and operated by one party, while the control system is owned or operated by a second party, can be considered under common control and one site. Although these facilities are considered one site for purposes of Title V permitting, the state of Georgia allows for separate Title V applications from each facility. If you believe that your facility and a neighboring facility can be considered one site, please contact the Air Protection Branch for a Site Determination. The Title V and SIP Construction/Operation applications are available from the Air Protection Branch by calling (404) 363-7000.

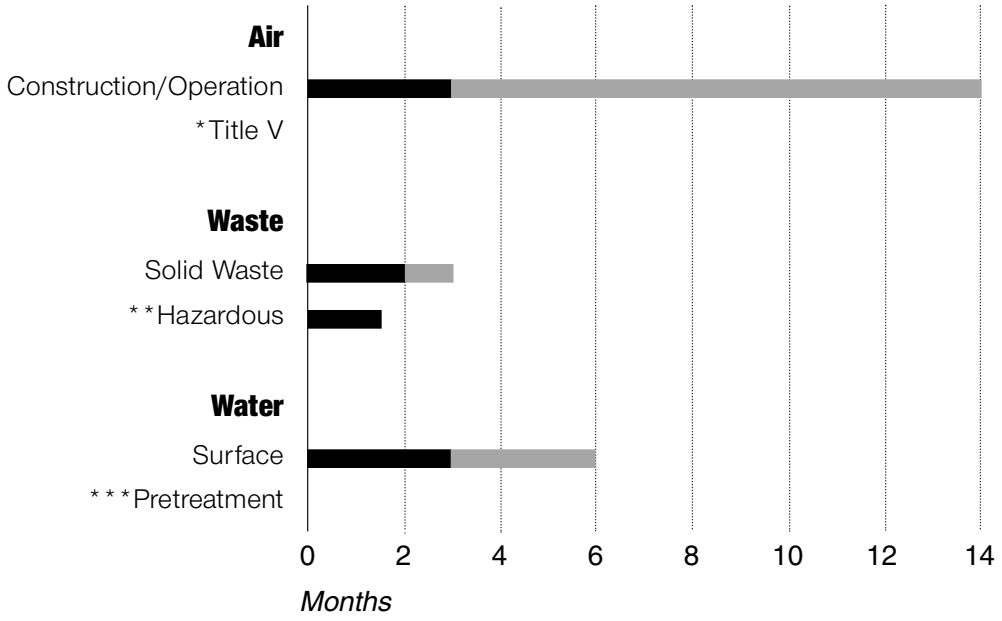
The Air Protection Branch does not charge a processing fee for any of the required applications. However, the Air Protection Branch does have an emission-based fee program. This Air Permit Fee Program meets the requirements of 40 CFR Part 70. Actual fees are based on emissions, and fees are currently charged at $25 per ton of emission. For more information on this program, please acquire Georgia's document "Procedures for Calculating Air Permit Fees." This document can be obtained by calling (404) 363-7000.

[3]The permits contained in this handbook were suggested by state permitting agencies.

Table 2.1 Summary Table of State Standards/Permits

Standard	Permit	Agency/Contact	Review Period
Air	*Permit to Construct/ Operate Title V (Part 70)*	Environmental Protection Division (EPD) Georgia Air Protection Branch Stationary Source Permitting Program Jim Burt Atlanta Tradeport, Suite 120 4244 International Parkway Atlanta, Georgia 30354 (404) 363-7000	90+ days for a minor source 180+ days for a major source or major modification
Waste (Hazardous/Solid)	*Solid Waste Handling Permit*	EPD Land Protection Branch Solid Waste Management Program Barbara Howard, P.E. Atlanta Tradeport, Suite 104 4244 International Parkway Atlanta, Georgia 30354 (404) 362-2572	90 days
	Notification of Hazardous Waste Activity, Generators, Transporters, and Facilities	EPD Hazardous Waste Mgmt. Branch Corrective Action Program Shelly Stroud 205 Butler Street, S.E. Suite 1154 Atlanta, Georgia 30334 (404) 656-7802	4 to 6 weeks
Water	*Groundwater Discharge Permit*	Not permitted in the state of Georgia	Not applicable
	Surface Water Discharge Permit	EPD Water Protection Branch Permitting, Compliance and Enforcement Program Mike Creason Atlanta Tradeport, Suite 110 4244 International Parkway Atlanta, Georgia 30354 (404) 362-2680	3 to 6 months
	Pretreatment Discharge Permit	Local municipality	Depends on the permitting municipality

Table 2.2 Permit Approval Time-line



Notes
Solid black line denotes the minimum review/approval period (where applicable); gray line denotes the maximum.

* There is not a standard review time for this permit.

** Review time for hazardous waste is 4–6 weeks.

*** Depends on the permitting municipality.

Table 2.3 Summary of Landfill Gas Systems Criteria

Type of Project	Specific Criteria
Landfill Gas Collection System	**Introduction** Extraction and control systems for landfill gas can be categorized according to: • Function (active, passive, or structure protection) • Location (perimeter or interior) • Technique used (air injection, barrier trench, vacuum assisted, etc.) Applications used in LFGTE projects emphasize the use of active extraction systems applied to interior systems with the use of vacuum to actively extract landfill gas. In general, this choice of application grants an effective operation of the landfill gas extraction system that can minimize or eliminate problems such as gas migration and subsurface fires. **General Guidelines** LFGTE will be reviewed on a case-by-case basis by the state's Solid Waste Management Program. However, some general guidance documents regarding the design will be provided. Unless otherwise approved by the Solid Waste Management Program all gas recovery systems must at least include the following design features: 1. At a minimum, the collection system is to include: A. Gas extraction devices or wellheads and each should have a sampling port with temperature, gauge pressure, and nitrogen or oxygen concentration measuring capabilities and/or devices. B. Leachate and Condensate Management with: 1. Accessibility 2. Air Intrusion Control 3. Corrosion Resistance 4. Resistance to waste heat of decomposition C. Extraction devices cannot be located in asbestos and other non-degradable material. D. Collection System Materials of Construction 1. PVC 2. HDPE 3. Fiberglass 4. Stainless Steel and other nonporous corrosion resistant materials that meet required engineering design criteria.

Type of Project	Specific Criteria
Landfill Gas Collection System, *continued*	E. Connector assembly for header pipes and system components is to include: 1. Positive closing throttle valve 2. Necessary seals and couplings 3. Access couplings 2. Maintenance of the collection system is to include monitoring of the following landfill gas parameters: 1. Gauge pressure at header pipes 2. Nitrogen or oxygen concentration 3. Temperature 3. A surface emissions monitoring plan of both the active and closed waste lifts and side slopes. A site design and operational plan minor modification for the collection system design and construction is to be submitted to the Solid Waste Management Program for review and approval. Along with the gas collection plan modification, applicable modifications to landfill design, operation and closure/post closure care plans should be submitted to the Solid Waste Management Program for review and approval. Modifications are required to address site plan revisions due to the addition of the collection and flare or combustion unit, specifically: 1. Location of the flare and/or combustion unit(s). 2. Settlement due to the addition of the methane collection and (if applicable) combustion system. 3. Records of maintenance and monitoring of the landfill as prescribed by the NSPS regulations and the Solid Waste Management Rules for a minimum of five years.

The remainder of Section 2 contains information about each of the permits required by Georgia for project development. The information is organized in tables and each table contains the following information about the subject permit:

- Applicability to Landfill Gas Projects
- Agency Contact
- Description
- Statute/Regulation
- Information Required/Suggestions
- Application Process
- Review Process
- Review/Approval Period
- Fee

Table 2.4 Air Quality Construction and Operation Permits

Applicability to Landfill Gas Projects	All equipment collecting and treating landfill gas, (which typically includes open and enclosed flares, internal combustion engines, boilers and fuel storage tanks) are subject to state air regulations.
Agency Contact	Environmental Protection Division (EPD) Air Protection Branch Stationary Source Permitting Program Jim Burt Atlanta Tradeport, Suite 120 4244 International Parkway Atlanta, Georgia 30354 (404) 363-7000
Description	Construction and Operation Permits may be required for landfill gas collection and treatment projects. *Pre-Approval:* Before an air pollution source is constructed or modified, a permit must be obtained from the Air Protection Branch. *Post-Approval:* Periodic emissions tests and/or reports may be required for some sources, depending on the nature of the operation and its emissions. The EPD will issue a state permit to operate when satisfied that the company operations will comply with all applicable air quality requirements.
Statute/Regulation	
Federal	The Clean Air Act, Section 110 and Title V, 42 U.S.C. 7401 et seq.
State	Part I of Chapter 9 of Title 12 of the O.C.G.A. Section 12-9-1, et seq.
Information Required/Suggestions	A description of the landfill gas collection system, expected landfill gas production rates and estimated pollution emissions over the life of the project, and air pollution control equipment.

Application Process	The air pollution emission rates showing compliance with the applicable regulation are to be submitted on state air permit application forms along with the associated drawings and descriptions.
Review Process	The EPD will perform a technical review of the application and determine if the project will be in compliance with all applicable regulations. The EPD will notify the applicant of any deficiencies. The EPD will prepare tentative determinations and make the draft permit available for review. A notice will be prepared for publication in the local newspaper.
Review/Approval Period	90+ days. Time may vary depending on complexity and completeness of the permit application. The range reflects the completeness of the initial application, the complexity of the installation and the need for information, etc.
Fees	No standard application fee. Consult Georgia “Procedures for Calculating Air Permit Fees” for emission-related fees.

Table 2.5 Title V (Part 70) Operating Permits

Applicability to Landfill Gas Projects

Companies subject to Title V include the following:

A. Facilities subject to acid rain requirements under Title IV of the Clean Air Act

B. Facilities (major sources) with a potential to emit:

- 100 tons per year or more of any regulated pollutant
- 50 tons per year of VOC or NOx in the Non-Attainment Area
- 10 tons per year or more of a single hazardous air pollutant (HAP)
- 25 tons per year of any combination of HAPs

C. Facilities subject to CAA § 111 (New Source Performance Standards) or § 112 (HAPs). At this time, facilities that do not fall under the major source definition listed above under these categories are deferred from Part 70 requirements.

Agency Contact

EPD
Air Protection Branch
Stationary Source Permitting and Compliance Programs

Jim Burt and James Eason
Atlanta Tradeport, Suite 120
4244 International Parkway
Atlanta, Georgia 30354
(404) 363-7000

Description

Title V of the Clean Air Act of 1990 (CAA) introduced an operating permit program, the purpose of which is to clarify, in a single document, all the air requirements applicable to a company. As specified before, companies subject to Title V must submit a complete application for a federally-enforceable operating permit to the state according to a schedule specified by the EPD.

Statute/Regulation

Federal The Clean Air Act, Title V (42 USC §§ 7401 et seq.): 40 CFR Part 70

State Part I of Chapter 9 of Title 12 of the O.C.G.A. Section 12-9-1, et seq.

Information Required/Suggestions

Facilities subject to Part 70 requirements must describe and quantify pollution sources and identify all federally-enforceable requirements. A Part 70 permit must be renewed every 5 years.

Application Process	The facility submits an application to the EPD that describes and quantifies pollution sources and identifies federally enforceable requirements.
Review Process	Within 60 days of receipt of an application, the EPD makes a completeness determination. Once a facility's application is deemed administratively complete, the EPD performs a technical review and issues a draft permit. EPA and neighboring states will have the opportunity to review draft permits. EPA also has the authority to object to a Title V permit. In addition, a citizen may also petition EPA to make an objection.
Review/Approval Period	There is no data on permit processing times because Part 70 is a new program.
Fees	No standard application fee. Consult Georgia "Procedures for Calculating Air Permit Fees" for emission-related fees.

Table 2.6 Solid Waste Handling Permits

Applicability to Landfill Gas Projects	LFGTE projects are considered a minor modification to the solid waste disposal permit for landfills.
Agency Contact	EPD Land Protection Branch Solid Waste Management Program Barbara Howard, P.E. Atlanta Tradeport, Suite 104 4244 International Parkway Atlanta, Georgia 30354 (404) 362-2572
Description	State solid waste rules are implemented by the Solid Waste Management Program of EPD. In order to add or change the landfill gas systems at an existing landfill, owners or operators are required to obtain state approval of a minor modification to the existing landfill solid waste handling permit.
Statute/Regulation	
Federal	Resource Conservation and Recovery Act (RCRA) Subtitle D and 40 CFR Parts 257 and 258.
State	Rules of Georgia, Department of Natural Resources, EPD, Chapter 391-3-4, Solid Waste Management.
Information Required/Suggestions	A description and justification of design and operational plans, drawings showing systems and components, construction quality assurance programs, and verification of compliance with other regulatory entities.
Application Process	The appropriate state application forms for a minor modification are to be submitted along with the appropriate design and operational plans showing the modifications.
Review Process	The EPD conducts technical reviews. The applicant is notified of any deficiencies. Approval is issued after deficiencies have been addressed.
Review/Approval Period	Up to 90 days
Fees	None

Table 2.7 Notification of Hazardous Waste Activity, Generators, Transporters and Facilities

Applicability to Landfill Gas Projects	The development of an landfill gas project may result in the generation, treatment, storage, and transport of a hazardous waste.
Agency Contact	EPD Hazardous Waste Management Branch Corrective Action Program Shelly Stroud 205 Butler Street. S.E. Suite 1154 Atlanta, Georgia 30334 (404) 656-7802
Description	Generators, transporters, and facilities that treat, store, and dispose of hazardous waste must notify the Georgia EPD/Hazardous Waste Management Branch by submitting EPA Form 8700-12 (Notification of Regulated Waste Activity). This form provides information to EPD as to the hazardous waste activities to be conducted at the facility. A facility that indicates that it intends to treat, store, or dispose of a hazardous waste will be required to submit a permit application. The regulatory requirements for the permit application process are found in 40 CFR Part 270.10 or Chapter 391-3-11-.11 of the Georgia Rules for the Management of Hazardous Waste.
Statute/Regulation	
Federal	Resource Conservation and Recovery Act (RCRA) Subtitle C and 40 CFR Parts 262.12, 263.11 and 264.11
State	Georgia Rules for the Management of Hazardous Waste, Chapter 391-3-11-.04
Application Process	The appropriate 8700-12 forms are submitted to the EPD.
Review Process	The Notification of Regulated Hazardous Waste Activity form is reviewed, processed and a permanent EPA Identification Number is assigned to the facility. The information from the form is recorded in the Resource Conservation and Recovery Information System.
Review/Approval Period	4–6 weeks
Fees	None

Table 2.8 Surface Water Discharge Permit

Applicability to Landfill Gas Projects	Landfill gas projects may need to comply with this requirement if they discharge wastewater to the surface waters of the state.
Agency Contact	EPD Water Protection Branch Permitting, Compliance and Enforcement Program Mike Creason Atlanta Tradeport, Suite 110 4244 International Parkway Atlanta, Georgia 30354 (404) 362-2680
Description	The surface water discharge permit combines the requirements of the state discharge permit program and the National Pollutant Discharge Elimination System (NPDES) into one permit for industrial facilities that discharge to state surface waters. The permit is designed to meet federal effluent guidelines when applicable and also ensure the discharge satisfies state water quality standards. All facilities that discharge wastewater directly to surface waters need this permit.
Statute/Regulation	
Federal	Federal Clean Water Act
State	Georgia Water Quality Control Act
Information Required/Suggestions	NPDES application forms 1 and 2 C
Application Process	The permit application forms must be completed in full prior to submittal to the EPD.
Review Process	The EPD will review the application, develop permit limits, and provide an opportunity for public participation by publishing notice of the application. The EPD develops permit limits and publishes a notice of tentative determination and conducts a public hearing if requested. The EPD issues the permit if the final determination is not contested. If contested, administrative procedures for the appeal process are followed.
Review/Approval Period	3 to 6 months
Fees	None

Table 2.9 Pretreatment Discharge Permit

Applicability to Landfill Gas Projects	Landfill gas projects may need to comply with this requirement if they discharge wastewater to a sanitary sewer.
Agency Contact	Local municipality
Description	A locally issued pretreatment permit is usually required for those facilities that seek to discharge to municipal wastewater treatment systems. For some of the smaller municipal systems, the pretreatment permits are issued by the EPD.
Statute/Regulation	
Federal	40 CFR 403 (for significant industrial users)
State	Georgia Water Quality Control Act
Local	Local ordinance is applicable to all users.
Application Process	Pretreatment permits are usually issued by local municipalities. The state and federal requirements become applicable only when a facility is defined as a significant industrial user by 40 CFR 403.
Review Process	The review is usually performed at the local level.
Review/Approval Period	Depends on the permitting municipality.
Fees	Depends on the permitting municipality.

3. Overview of Local Standards and Permits

Within the framework of federal and state regulation, local governments will have some jurisdiction over LFGTE development in nearly all cases. Typically, local permits address issues that affect the surrounding community. These permits generally fall under the categories of construction, environment and health, land use, and water quality/use. Local governments are also responsible for administering some permits for federal and state regulations in addition to their own. For example, many local governments are responsible for ensuring compliance with federal air quality regulations. It should be noted, however, that some local standards and regulations are more strict than state or federal regulations.

Steps to Successful Local Permit Approval:

The following six steps will assist LFGTE project developers to achieve successful local permit approval:

Step 1 Determine which local authorities have jurisdiction over the project site.

Step 2 Contact local, city, and/or county planning and public works departments to obtain information about applicable permits and to discuss your plans. Meeting with agency staff to discuss the landfill gas project and required permits often helps expedite the permitting process.

Step 3 Obtain essential information regarding each permit, including:

- what information is required
- the permitting process that should be followed
- time frames (including submittal, hearing, and decision dates)

Step 4 Obtain copies of the regulations to compare and verify what is required in the permit applications. If they differ, contact the appropriate permitting agency.

Step 5 Submit a complete application. Incomplete applications typically result in processing delays.

Step 6 Attend meetings or hearings where the application will be discussed to respond to any questions that are raised. Failure to do so could result in delays.

Typical Local Permits

The table on the following page provides typical local permits and approvals required for LFGTE projects.

Table 3.1 Local Permits and Standards

Permit	Description
Building Permit	Most county/local governments require building permits for construction, which entail compliance with several types of building codes, such as plumbing and electrical. A typical building permit application may require detailed final plans for structures, including electrical and plumbing plans, floor layout, sewage facilities, a storm water drainage plan, size and shape of lot and buildings, setback of buildings from property lines and drain field, access, size and shape of foundation walls, air vents, window access, and heating or cooling plants (if included in the design).
Zoning/Land Use	Most communities have a zoning and land use plan that identifies where different types of development are allowed (i.e., residential, commercial, and industrial). The local zoning board determines whether a particular project meets local land use criteria and can grant variances if conditions warrant. A landfill gas project may require an industrial zoning classification.
Storm Water Management	Some local public works departments require a permit for discharges during construction and operation of a LFGTE project. Good facility design that maintains the pre-development runoff characteristics of the site will typically enable the project to meet permitting requirements easily.
Solid Waste Disposal	A LFGTE project may generate solid wastes, such as packaging material, cleaning solvents, and equipment fluids. If the landfill is closed, disposal of these solid wastes may be subject to review by a local authority.
Wastewater	The primary types of wastewater likely to be generated by a LFGTE project include maintenance wastewater and cooling tower blowdown. The city engineer's office should be contacted to provide information about available wastewater handling capacity and any unique condensate treatment requirements or permits for landfills.
Fire Hazards and Precautions	The mix of gases in landfill gas has a moderate to high explosion potential; methane is explosive in concentrations of 5 to 15 percent in air. Because methane has the potential to migrate from the landfill to on-site or off-site structures, it poses a significant public safety hazard. EPA requires that methane concentrations be less than 5 percent at a landfill property line, and less than 1.5 percent in a facility's structures. County regulations may call for even stricter standards to be observed at the landfill.
Noise	Most local zoning ordinances stipulate the maximum allowable decibel levels from noise sources. These levels vary depending on the location of the site. For example, LFGTE projects located near residential areas will likely have to comply with stricter noise level standards than projects located in non-populated areas.

Part 2: Incentive Programs

1 Overview of Federal Incentive Programs

There are three federal incentive programs that may apply to LFGTE projects: the Section 29 Tax Credit, the Renewable Energy Production Incentive (REPI), and the Qualifying Facilities (QF) Certification. Each program is described below.

1.1 Section 29 Tax Credit

Developers of LFGTE projects who sell landfill gas to an unrelated third party may qualify for a tax credit under Section 29 of the Internal Revenue Service (IRS) tax code. As a result of this stipulation, project developers may bring in an outside party when developing power projects in order to take advantage of the credits. Section 29 Tax Credit was established in 1979 to encourage development of unconventional gas resources, such as landfill gas. Section 29 tax credits are available through 2007 to landfill gas projects that have a gas sales agreement in place by December 31, 1996 and are placed in service by June 30, 1998. The credit has been extended several times by the U.S. Congress, but there is no guarantee that these extensions will continue. The credit is worth $3.00 per barrel of oil-equivalent (on a MMBtu basis) and is adjusted annually for inflation.

1.2 Renewable Energy Production Incentive (REPI)

The Renewable Energy Production Incentive (REPI), mandated under the Energy Policy Act of 1992, may provide a cash subsidy of up to $0.15 per kWh to publicly owned qualified renewable energy sources, such as landfills, for the period October 1993 through September 2003.[4] The Department of Energy (DOE) will make incentive payments for 10 fiscal years, beginning with the fiscal year in which application for payment for electricity generated by the facility is first made and the facility is determined by DOE to be eligible for receipt of an incentive payment. The period for payment under this program ends in fiscal year 2013.

For further information, contact:

U.S. Department of Energy
National Renewable Energy Laboratory
Golden Field Office
Golden, Colorado 80403
Phone: (303) 275-4706

U.S. Department of Energy
Efficiency and Renewable Energy
Forrestal Building, Mail Station EE-10
1000 Independence Avel, S.W.
Washington, DC 20585
Phone: (202) 586-4564

[4]Final Rule Making, 10 Federal Register Part 451, July 19, 1995, Vol. 60, No. 138.

1.3 Qualifying Facilities Certification

LFGTE projects that generate electricity will benefit from Qualifying Facilities (QF) certification, which is granted through the Federal Energy Regulatory Commission (FERC). The following describes the benefits of QF status and the steps for applying for such status.

The Public Utility Regulatory Policies Act (PURPA)—one of five parts of the National Energy Act of 1978—was designed to promote conservation of energy and energy security by removing barriers to the development of cogeneration facilities and facilities that employ waste or renewable fuels. Such facilities are called Qualifying Facilities, or QFs. Under PURPA, utilities are required to purchase electricity from QFs at each utility's avoided cost of generating power. PURPA provides that a small power production facility, such as a LFGTE project that meets its standards, can become a QF.

In order to apply for QF status, applicants must prepare either (1) a Notice of Self-Certification, which asserts compliance with the Commissions' technical and ownership criteria, or (2) an Application for Commission Certification of Qualifying Status, which requires a draft Federal Register notice and which provides actual Commission approval of QF status. In either case, the applicant must also file Form 565, which is a list of questions about the project, and must pay any filing fees associated with certifications, exemptions, and other activities. FERC will provide the QF "Info Packet" that describes the necessary steps, requirements, and background information. After submittal of the initial application, further justifications and submittal of information may be required.

For the QF Info Packet and applications, contact:

Federal Energy Regulatory Commission
Qualifying Facilities Division
825 North Capital Street, N.E.
Washington, DC 20426
Phone: (202) 208-0571

2 Overview of State Funding Programs

This section provides information regarding the environmental infrastructure financing opportunities available through the Georgia Environmental Facilities Authority (GEFA). GEFA is a state agency that, among other responsibilities, makes state-backed low interest loans to cities, counties, and solid waste management authorities for water, sewer and solid waste projects. The following summarizes GEFA's loan and grant programs for solid waste management infrastructure improvement projects, which could include landfill gas projects.

2.1 Recycling and Solid Waste Facilities Loan Program

GEFA's municipal solid waste loan program finances solid waste management solutions, particularly facilities that help to minimize the waste stream or to mitigate environmental hazards. The maximum loan amount is up to $2 million; the maximum term is up to 20 years. The current interest rate is 4.76%. Applications are accepted at any time. Landfill gas projects can be financed under this program. The Solid Waste Facilities Loan Program is limited to Georgia cities, counties and solid waste management authorities only. GEFA is not empowered under Georgia law to make loans or grants to private or non-profit organizations. Partnerships with private sector developers and/or project operators may be permissible depending on specific project arrangements. GEFA is pleased to discuss specific project financing possibilities at any time. There are no application fees or closing costs associated with the loan program. Please contact GEFA at (404) 656-0938 for more information.

2.2 Recycling and Waste Reduction Grants

Grants are available to help local governments build facilities and purchase equipment for recycling or waste reduction programs. The maximum grant amounts are: $10,000 per single jurisdiction, $25,000 per multi-jurisdictional application. These grants are available until funds are exhausted. Funding cycles usually occur once per calendar year. Contact GEFA for the latest information on this program. Potential funding for landfill gas projects may be discussed with the program manager.

Notes